CLAIMS

1. A method of measuring a protein based on a degree of coloring occurring when a liquid sample is mixed with a protein measurement indicator,

wherein information reflecting a concentration of creatinine in the liquid sample is obtained, and then, based on the obtained information, an influence of the creatinine on a protein concentration measurement is eliminated.

2. The method of measuring a protein according to claim 1, the method comprising:

a first step of obtaining a first response value which reflects a protein concentration in the liquid sample, based on coloring caused by a system containing the liquid sample and the protein measurement indicator;

a second step of obtaining a second response value which reflects a creatinine concentration in the liquid sample in a system containing the liquid sample but not containing the protein measurement indicator; and

a third step of calculating a protein concentration in the liquid sample, based on the first response value and inconsideration of the second response value.

3. The method of measuring a protein according to claim 2, wherein the second step includes calculation, based on the second response value, of an influence caused by the amount of creatinine on the first response value;

the third step including calculation of a protein

concentration as a preliminary value based on the first response value, and calculation of a final protein concentration by subtracting the influence of the amount of creatinine from the preliminary value.

4. The method of measuring a protein according to claim 3, wherein the calculation in the second step of the creatinine influence is based on a predetermined calibration curve;

the calibration curve being prepared by measuring, in accordance with a dye binding method or a protein error method, response values with a plurality of liquid samples each having an identical protein concentration with but a different creatinine concentration, and then correlating the response values with the creatinine concentrations.

5. The method of measuring a protein according to claim 2, wherein in the third step, a corrected response value is obtained by correcting the first response value based on the first and the second response values, and the protein concentration in the liquid sample is calculated based on the corrected response value.

6. The method of measuring a protein according to claim 5, wherein the corrected response value is calculated by using an arithmetic expression derived from a plurality of sample groups each consisting of a plurality of liquid samples having an identical protein concentration but different creatinine concentration, the sample groups having different protein concentrations, respectively,

the arithmetic expression being derived from a method including: a step of measuring a response value for each of the liquid samples in each sample group; a step of obtaining a relationship between the response values from the liquid samples and the creatinine concentrations in each sample group, as a plurality of relational expressions for all of the sample groups in the form of linear expression; and a step of obtaining a relationship between a gradient in each of the relational expressions and the response value from the liquid sample having a specific cratinine concentration in each sample group, in the form of relational expression.

7. The method of measuring a protein according to claim 2, wherein the measurement of the first response value in the first step is made in accordance with a first protein measurement procedure provided by a dye binding method or a protein error method.

8. The method of measuring a protein according to claim 2, wherein the measurement of the second response value in the second step is made in accordance with an enzyme method, Jaffe method, copper chelate oxidation method, palladium complex competition method or Benedict method.

9. The method of measuring a protein according to claim 7, wherein the protein concentration calculation in the third step is based on a predetermined calibration curve,

the calibration curve being made by a method including: a step of obtaining a plurality of responses for the respective

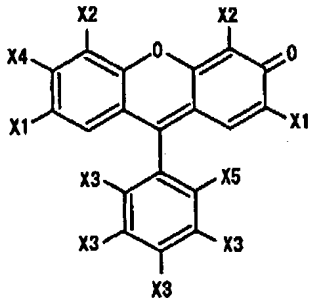
liquid samples based on the first protein measurement procedure; a step of measuring a protein concentration in the liquid samples based on a second protein measurement procedure which is less susceptible to creatinine influence than the first protein measurement procedure; and a step of relating the responses to the protein concentrations measured by the second protein measurement procedure.

10. The method of measuring a protein according to claim 9, wherein the second protein measurement procedure is provided by an immunoturbidimetric method, immunolatex agglutination method or ternary complex method.

11. The method of measuring a protein according to claim 7, wherein the protein measurement indicator is provided by a xanthene dye or a triphenylmethane dye.

12. The method of measuring a protein according to claim 11, wherein the xanthene dye is a halogenated xanthene dye which has a chemical structure expressed in the following Chemical Formula 1;

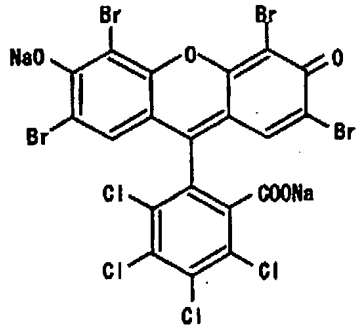
Chemical Formula 1



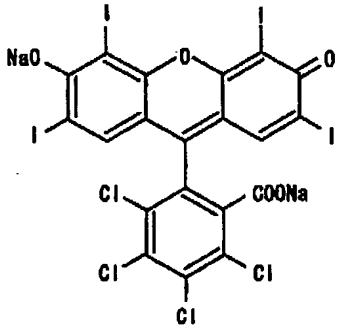
(In Chemical Formula 1, X1 represents a halogen, a nitro group or a nitroso group, X2 represents a halogen, X3 represents a halogen or hydrogen, X4 represents a hydroxyl group or its salt, and X5 represents a carboxyl group or its salt.)

13. The method of measuring a protein according to claim 12, wherein the halogenated xanthene dye has a chemical structure represented by a selected one of the following Chemical formulas 2 through 6:

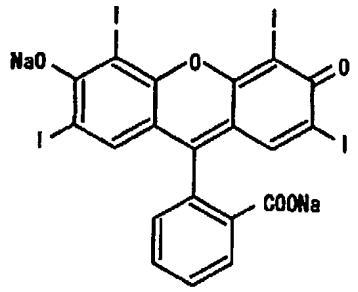
Chemical Formula 2



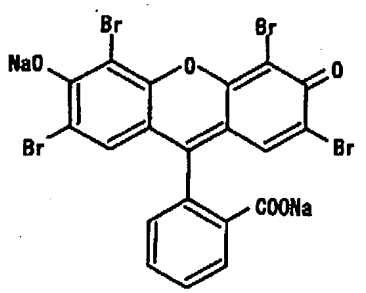
Chemical Formula 3



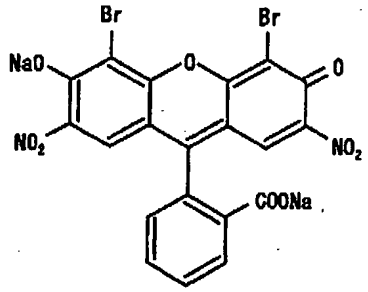
Chemical Formula 4



Chemical Formula 5



Chemical Formula 6



14. The method of measuring a protein according to claim 11, wherein the triphenylmethane dye is provided by Tetrabromophenol Blue (TBPB), Bromochlorophenol Blue (BCPB) or Bromophenol Blue (BPB).

15. The method of measuring a protein according to claim 1, wherein the protein measurement indicator is carried by a carrier in a dried form before being exposed to the liquid sample.

16. The method of measuring a protein according to claim 1, wherein the protein is provided by albumin.

17. The method of measuring a protein according to claim 1, wherein the liquid sample is provided by urine, blood, or cerebrospinal fluid.

ABSTRACT

The present invention relates to a technique of measuring a protein based on a degree of coloring in a liquid sample mixed with a protein measurement indicator. In the present invention, information reflecting creatinine concentration in the liquid sample is obtained, and then an influence quantity caused by creatinine to the protein concentration measurement is eliminated based on the information.